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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/812,548	03/29/2004	Nobutaka Kitagawa	2102475-992060	3437
26379	7590	02/06/2006	EXAMINER	
DLA PIPER RUDNICK GRAY CARY US, LLP			INGHAM, JOHN C	
2000 UNIVERSITY AVENUE			ART UNIT	
E. PALO ALTO, CA 94303-2248			PAPER NUMBER	
			2814	

DATE MAILED: 02/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/812,548	Applicant(s) KITAGAWA, NOBUTAKA	
	Examiner John C. Ingham	Art Unit 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3/29/04; 6/03/05</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

The disclosure is objected to because of the following informalities: lines 4 and 5 of page 15 recite "the impurity concentrations are kept lower in the entire well regions 33 and 34 than in the entire well region 33 and 34". The second occurrences of 33 and 34 should be changed to 11 and 12, respectively.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Yun (US 6,133,078).

3. Regarding claim 1, Yun discloses in Figure 11 a semiconductor device comprising: an internal device (B) including a first well region (56) and a first semiconductor element formed on the first well (col 7 ln 5-6); a protection device (A) including a second well region (50) and a second semiconductor element formed on the second well region (col 7 ln 5-6), the second well region having a lower impurity

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concentration than the first well region (col 6 ln 55-60), the protection device protecting the first semiconductor element (abstract).

4. With regards to claim 6, Yun discloses in Figure 11 wherein an entire portion of the second well region (52, 50) in a depth direction has a lower impurity concentration than an entire portion of the first well region (60, 58, 56) in the depth direction.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yun and Chen (US 6,844,595).

8. Regarding claim 2, Yun discloses the device according to claim 1, but does not specify that the second semiconductor element includes a current path connected between an external connection and ground. Yun also does not disclose that the first

semiconductor element has an input/output terminal connected to the external connection.

Chen teaches in Figures 7A and 7B an ESD element wherein the second element includes a current path having one end connected to an external connection (Node) terminal and another end connected to a ground potential (V_{ss}). Chen teaches that in order to protect semiconductor chips from damage (col 1 ln 13-14) the second element guides a current from Node to the reference potential V_{ss} in an ESD event (col 2 ln 12-16), and that the first element is connected to Node (col 1 ln 16-18). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Chen on the device of Yun to protect semiconductor chips from damage (col 1 ln 13-14).

9. Regarding claim 3, Chen teaches that a predetermined breakdown voltage may be adjusted in accordance with the internal circuit, and teaches modification to the ESD protection circuit in Figure 9 for decreasing the trigger voltage. The breakdown voltage of the ESD circuit is obviously less than that of the internal circuit to provide overvoltage protection.

10. Regarding claim 4, Chen teaches that the protection device further includes a trigger circuit (Figure 7A, items C_G , R_G and 32) which starts an operation of the second semiconductor element (lateral npn); the second element is a bipolar transistor having a control terminal (18) connected to the trigger circuit; and the trigger circuit supplies the control terminal of the second element with an instruction to start the operation of the element, when current flows from the external connection terminal to increase a

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potential at the input/output terminal, and when the potential at the input/output terminal is less than the breakdown voltage of the first semiconductor element (col 7 ln 8-12).

11. With regards to claim **5**, Chen teaches in Figure 7A wherein the second semiconductor element is a MOS transistor; and a gate (32) potential of the MOS changes in synchrony with a voltage at one end of the current path (Node).

12. Claims **7-18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yun in view of Chen as applied to claims 2-5 above, and further in view of Tsuji (US 6,847,059).

13. Regarding claims **7 and 13**, Yun discloses all elements discussed earlier in paragraph 3, but does not disclose wherein the second well region has a greater depth than the first well region.

Tsuji teaches that impurity doped regions of an ESD device may be formed as deep well regions having a relatively low impurity concentration (col 10 ln 4-6) in order to raise the inverse breakdown voltage (col 10 ln 7-8). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Tsuji on the device of Yun.

14. Regarding claims **8 and 14**, Yun and Chen provide teachings as discussed earlier in paragraph 8.

15. With regards to claims **9 and 15**, Yun and Chen provide teachings as discussed earlier in paragraph 9.

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16. With regards to claims **10 and 16**, Yun and Chen provide teachings as discussed earlier in paragraph 10.

17. With regards to claims **11 and 17**, Yun and Chen provide teachings as discussed earlier in paragraph 11.

18. With regards to claims **12 and 18**, Yun provides teachings as discussed earlier in paragraph 4.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John C. Ingham whose telephone number is (571) 272-8793. The examiner can normally be reached on M-F, 8am-5pm.

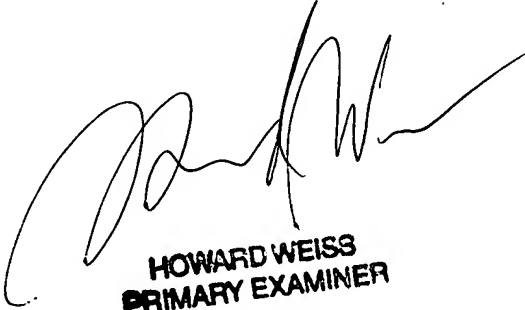
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

John C Ingham
Examiner
Art Unit 2814

jci



**HOWARD WEISS
PRIMARY EXAMINER**